Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of:	)	
	)	
Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment Pursuant to the Spectrum Pipeline Act of 2015	)	GN Docket Nos. 14-177, 15-319, 17-183 and 17-258

COMMENTS OF
THE NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

The National Public Safety Telecommunications Council (NPSTC) submits these comments in response to the Public Notice in the above captioned proceeding.[1] The Public Notice seeks comment on an analysis of the results of the 2015 rule changes relating to the 3550-3650 MHz band. As indicated in the Public Notice, the Spectrum Pipeline Act requires the Commission to submit a report to Congress that includes both that analysis for the 3550-3650 MHz band rules already adopted and an analysis of proposals to promote and identify additional spectrum bands that can be shared between 6 GHz and 57 GHz. Accordingly, these NPSTC comments address both elements the Spectrum Pipeline Act requires for the Commission report to Congress.

[1] *Public Notice*, DA-18-841, released August 10, 2018.

The National Public Safety Telecommunications Council

The National Public Safety Telecommunications Council is a federation of public safety organizations whose mission is to improve public safety communications and interoperability through collaborative leadership. NPSTC pursues the role of resource and advocate for public safety organizations in the United States on matters relating to public safety telecommunications. NPSTC has promoted implementation of the Public Safety Wireless Advisory Committee (PSWAC) and the 700 MHz Public Safety National Coordination Committee (NCC) recommendations. NPSTC explores technologies and public policy involving public safety telecommunications, analyzes the ramifications of particular issues and submits comments to governmental bodies with the objective of furthering public safety telecommunications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications.

The following 16 organizations serve on NPSTC's Governing Board:[2]

American Association of State Highway and Transportation Officials
American Radio Relay League
Association of Fish and Wildlife Agencies
Association of Public-Safety Communications Officials-International
Forestry Conservation Communications Association
International Association of Chiefs of Police
International Association of Emergency Managers
International Association of Fire Chiefs
International Municipal Signal Association
National Association of State Chief Information Officers
National Association of State Emergency Medical Services Officials
National Association of State Foresters
National Association of State Technology Directors
National Council of Statewide Interoperability Coordinators
National Emergency Number Association
National Sheriffs' Association

[2] These comments represent the views of the NPSTC Governing Board member organizations.

Several federal agencies are liaison members of NPSTC. These include the Department of Homeland Security (the Federal Emergency Management Agency, the Office of Emergency Communications, the Office for Interoperability and Compatibility, and the SAFECOM Program); Department of Commerce (National Telecommunications and Information Administration); Department of the Interior; and the Department of Justice (National Institute of Justice, Communications Technology Program). Also, Public Safety Europe is a liaison member. NPSTC has relationships with associate members: The Canadian Interoperability Technology Interest Group (CITIG) and the Utilities Technology Council (UTC), and affiliate members: The Alliance for Telecommunications Industry Solutions (ATIS), Open Mobile Alliance (OMA), Telecommunications Industry Association (TIA), TETRA Critical Communications Association (TCCA), and Project 25 Technology Interest Group (PTIG).

NPSTC Comments

The Public Notice indicates the Spectrum Pipeline Act requires the Commission to give Notice and provide an opportunity for public comment before submitting a report to Congress by November 2, 2018 that includes the following information:

> 1) an analysis of the results of the 2015 rule changes relating to the frequencies between 3550 megahertz and 3650 megahertz; and
>
> (2) an analysis of proposals to promote and identify additional spectrum bands that can be shared between incumbent uses and new licensed and unlicensed services under such rules and identification of at least 1 gigahertz between 6 GHz and 57 GHz for such use.

NPSTC shares the following recommendations to which the Commission should adhere in responding to these requests for analysis.

1. Analysis of the Results of Rule Changes at 3.5 GHz

The Commission, and especially the Office of Engineering and Technology (OET), have done a significant amount of work on the sharing rules for the 3550-3650 MHz band. NPSTC is pleased to see the involvement of OET as real spectrum management inherently involves engineering, not merely political direction and spectrum auctions. The rules adopted to implement the Citizens Broadband Radio Service (CBRS) in the 3550-3650 GHz (3.5 GHz) band involve some interesting dynamic spectrum sharing approaches. The rules include provisions for a Spectrum Access System (SAS), i.e., a database lookup of incumbent users, and Environmental Sensing Capability (ESC), i.e., off-air monitoring for signals of incumbent users. The priority facilities that CBRS must protect are primarily U.S. Navy shipboard radars and ground-based radar sites at listed military installations.

NPSTC believes it is premature for the Commission to report to Congress that the results of the rules adopted for 3.5 GHz are either a success or a failure in managing the spectrum. Although some testing has been conducted, any significant operation of CBRS devices is yet to occur. Accordingly, it is not yet possible to determine with any degree of accuracy whether the real-world results of the 2015 rule changes relating to the frequencies between 3550 MHz and 3650 MHz is positive or negative.

Moreover, it is not valid to assume results of testing SAS and ESC systems at 3.5 GHz would have validity for sharing in other bands. NPSTC believes any system of dynamic spectrum sharing must be designed based on the specifics of the relevant spectrum environment, including the systems to be protected. The spectrum environment at 3.5 GHz is somewhat unique in overall scope, terrain and the rapidity of adding new primary or expanded operations that must be protected.

The National Telecommunications and Information Administration (NTIA) provided the derivation and definitions of exclusions zones along the U.S. coastline that CBRS operations must initially avoid to protect shipboard radars[3] The exclusion zones are based on NTIA technical calculations considering parameters of the systems to be protected specific to the 3.5 GHz band, as detailed in the extensive NTIA report. The exclusion zones at 3.5 GHz are mostly confined to run along the edges of the U.S. coastlines. The NTIA report also lists 27 ground-based radar sites at military installations that must be protected.[4]

A recent article in Defense News indicated that the U.S. Navy currently has 280 ships today as of February 2018, with plans to expand to 326 ships by 2023.[5] Accordingly, compared to many other bands, the facilities at 3.5 GHz to be protected are relatively small in number. Also, being near the coast, an ESC which monitors off-air for the presence of protected signals in the 3.5 GHz band, should enjoy the benefit of mostly a clear line-of-sight path between monitoring receivers and shipboard radar signals. This is not necessarily the case for other bands, as an ESC system of monitoring would need to cover most of the geography of the U.S. and be designed for multiple terrain environments, possible building obstacles and potential foliage to detect current and future incumbent use properly. Therefore, NPSTC believes the provisions set forth in rules in the 3.5 GHz band would not necessarily work the same way in another band with a different environment.

Also, the results of Commission rules do not always show up immediately. Globalstar recently submitted a petition for a notice of inquiry to address a 2 dB rise in the noise floor that it has measured in the 5 GHz band spectrum used for satellite uplinks that is shared with unlicensed UNII

[3] NTIA Report 15-517, 3.5 GHz Exclusion Zone Analyses and Methodology, June 2015, Reissued March 2016 with some corrections and clarifications.
[4] See Table C-1 of the NTIA report.
[5] https://www.defensenews.com/smr/federal-budget/2018/02/13/us-navy-to-add-46-ships-in-five-years-but-355-ships-is-well-over-the-horizon/

operations.[6] Although the exact determination needs to be addressed further, Globalstar included an engineering analysis pointing to unlicensed operation in the 5 GHz band as a likely cause of the 2 dB rise in noise floor. These measurements show that spectrum sharing is not always "free" from potential impact to primary licensees, and that it may take several years for the real impact of sharing to materialize.

Therefore, in reporting to Congress, NPSTC recommends the Commission refrain from declaring the results of spectrum sharing rules at 3.5 GHz either a success or a failure, as it is premature to do so. Also, the Commission should refrain from claiming that dynamic spectrum sharing with an SAS and an ESC as being tested at 3.5 GHz would be a valid mechanism in other bands in which sharing may be considered going forward. Sharing mechanisms are dependent on the specific spectrum environment involved, and the environment at 3.5 GHz is rather unique with primary operations located mostly along the coastline with a low rapidity of increase in facilities over time.

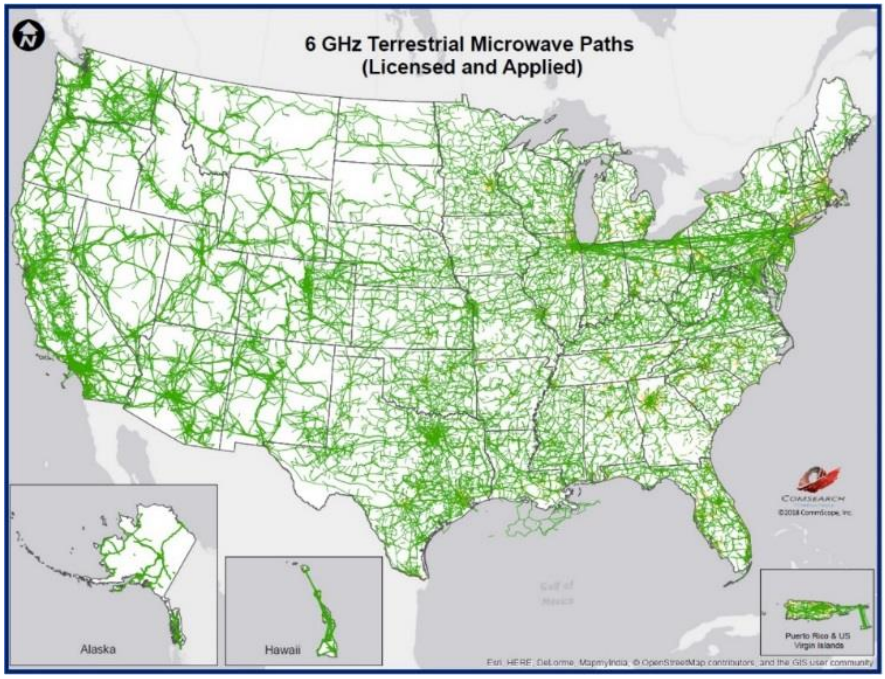
2. Analysis of Sharing Proposals and Identification of at Least 1 GHz for Sharing Between 6 GHz and 57 GHz

In response to the Commission's Notice of Inquiry regarding sharing of bands between 3.7 GHz and 24 GHz, NPSTC submitted comments noting the need to protect microwave operations in the 6 GHz band from interference.[7] These comments also addressed some bottom line technical requirements of such protection, based on the 99.999% ("five-nines") reliability parameters normally used to specify requirements for these microwave systems. Since those comments were filed, numerous parties have provided input through reply comments and *Ex Parte* filings that address

[6] See Globalstar Petition for Notice of Inquiry, RM-11808, submitted May 21, 2018 and associated Commission Public Notice, *Consumer Governmental Affairs Bureau Reference Information Center Petition for Notice of Inquiry* Report No. 3092, released June 6, 2018.
[7] NPSTC Comments in GN Docket NO. 17-183, submitted October 2, 2017.

various aspects of potential sharing in the 6 GHz band. The record is full of filings on both sides of the equation, some expressing significant concerns about the potential for interference to 6 GHz microwave networks and others claiming that sharing can be implemented with minimal interference.

Although there is no agreement on the potential for sharing, there is adequate information in the record to show that the 6 GHz band is extensively used. For example, AT&T submitted the following map of microwave links in the band and advised the 6 GHz band currently supports approximately 100,000 microwave links. [8]



Trade press has reported that the Chairman advised of plans to put forward a Notice of Proposed Rulemaking on sharing at 6 GHz this fall. It is yet to be determined whether or not that NPRM will be released prior to the November 2 deadline for the Commission's report to Congress. Even if it is, NPSTC recommends the Commission be clear in its report to Congress that incumbent

[8] AT&T Services, Inc. *Ex Parte* submission of information discussed with OET, filed March 19, 2018.

usage in the 6 GHz band is significant, and that protection of incumbents is a complex issue yet to be resolved. The Congressional direction to find an additional 1 GHz of spectrum for sharing should not pre-determine the real engineering that must be done by OET and users of the 6 GHz band to assess if/how sharing can be implemented with no interference to critical microwave links in the band.

Conclusion

NPSTC appreciates the opportunity to provide recommendations on development of the Commission's required report to Congress regarding the results of rules adopted at 3.5 GHz and on proposals for further sharing in the 6 GHz to 57 GHz bands. In developing its report to Congress, NPSTC recommends the Commission refrain from declaring the results of spectrum sharing rules at 3.5 GHz either a success or a failure, as it is premature to do so. While testing has been conducted, minimal if any real-world operation of CBRS at 3.5 GHz has yet occurred. The Commission also should refrain from claiming that dynamic spectrum sharing with an SAS and an ESC as being tested at 3.5 GHz would be a valid mechanism in other bands in which sharing may be considered going forward. Sharing mechanisms are dependent on the specific spectrum environment involved. Unlike that in other bands, the environment at 3.5 GHz is rather unique with primary operations located mostly along the coastline with a low rapidity of increase in facilities over time.

With regard to the second required element of the report to Congress, NPSTC recommends the Commission be clear that incumbent usage in the 6 GHz band is significant, and that protection of incumbents is a complex issue yet to be resolved. NPSTC is aware of the Congressional direction to find an additional 1 GHz of spectrum for sharing. However, that should not pre-determine the real engineering that must be done to assess if/how sharing can be implemented with no interference to approximately 100,000 critical microwave links in the 6 GHz band.

Ralph A. Haller, Chairman

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